Seismological Bulletin of Syowa Station, Antarctica 1968 - 1969

Compiled by

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The seismological observation at Syowa Station was started in 1959 by the 3 rd partyoaf Japanese Antarctic Research Expedition using a HES seismograph of Z component. In 1961, added with HES seismographs of two horizontal components, the seismological observation at Syowa Station was carried on with a three-component seismograph.

Since 1966, the observations have been continued by JARE, using three-component HES seismographs.

A three-component long period seismograph of Press-Ewing type was set at Syowa Station in 1967.

In this bulletin the data of the respective seismic events interpreted on the seismograms are listed in chronological order.

1. Date.
2. Identified phase name with its sharpness indication (e or i) and ground motion direction (+: UP, E, N, −: Down, W, S). If a phase was identified by horizontal components, the phase is denoted with E (detected by E-W component) or N (detected by N-S component). The data from long period seismographs are donoted with LP.
3. Arrival time in G. M. T.,
4. Period of the phase in seconds.
5. Amplitude in millimeters.

The instrumental constants and magnification curve of HES seimographs are shown in Table 1. The seismographs are usually operated with the attenuation factor $\mu=1/5$ in the summer season and $\mu=1/2$ in the winter season.

In 1968, the seismographs were operated by Mr. M. Yoshida and Dr. T. Eto of the 9 th JARE. The reading data were sent to USCGS through-out the wintering

period. HES seismograms were operated with $\mu=1/5$ from February to May 9 and from January 1 to January 31, and with $\mu=1/2$ from May 9 to January 1.

The seismograms were read again by Miss R. Kawashima of Earthquake Research Institute.

Table 1. Instrumental constants of HES and LP seismographs.

Component	Z	N－S	E－W
HES			
T_1 (s)	1.0	1.0	1.0
S_1 (A/mm)	2.80×10^{-6}	2.03×10^{-5}	2.03×10^{-5}
R_1 (Ω)	940	920	930
Ω_1 (Ω)	820	1160	920
h_1	1.0	1.0	1.0
1968－1969			
T_2 (s)	1.06	1.04	1.04
S_2 (A/mm)	1.47×10^{-9}	1.20×10^{-9}	1.35×10^{-9}
R_2 (Ω)	600	650	630
Ω_2 (Ω)	1200	1200	1200
h_2	1.0	1.0	1.0
LP			
T_1 (s)	18.7	18.1	16.4
S_1 (A/mm)	2450	3240	2820
R_1 (Ω)	3100	3200	2900
Ω_1 (Ω)	45	156	38
h_1	1.0	1.0	1.0
T_2 (s)	0.91	0.98	0.97
S_2 (A/mm)	0.906×10^{-9}	0.812×10^{-9}	0.790×10^{-9}
R_2 (Ω)	520	530	540
Ω_2 (Ω)	1702	1868	1960
h_2	1.0	1.0	1.0

T_1: Period of the pendulum.
T_2: Period of the galvanometer.
S_1: Sensitivity of the transducer.
S_2: Sensitivity of the Galvanometer.
R_1: Resistance of the pendulum coil.
R_2: Resistance of the galvanometer coil.
Ω_1: External damping resistance of the transducer.
Ω_2: External damping resistance of the galvanometer.
h_1: Damping constant of the pendulum.
h_2: Damping constant of the galvanometer.

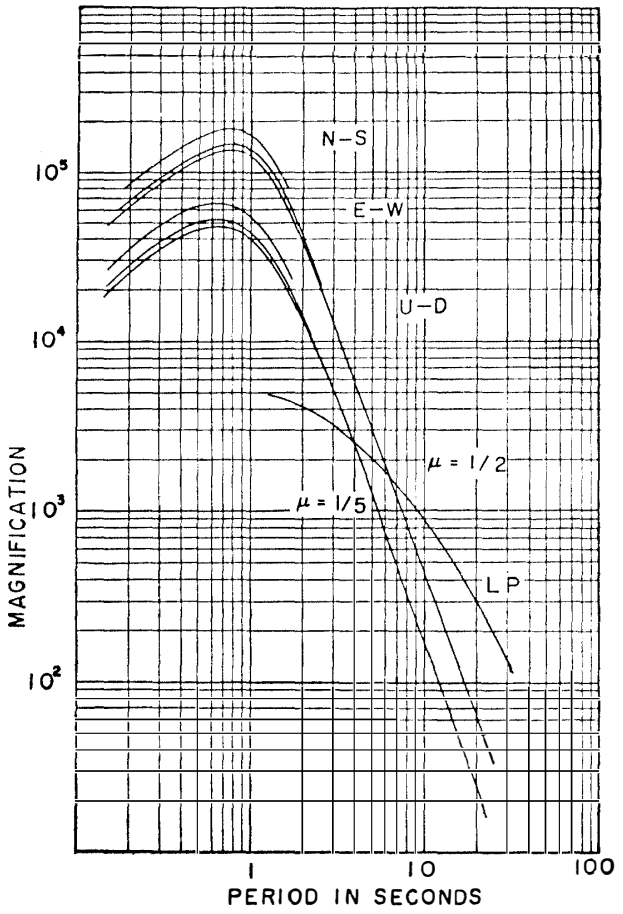

Fig. 1. Magnification curves of HES and Long Period seismographs.

February 1968

Date	Component and Phase	Arrival time h	Arrival time m	Arrival time s	Period s	Amplitude mm
02–03	Extreme microseismic activity					
06	−ePE	11	30	17.7	1.2	2.5
	−ePN			17.7	1.2	1.0
	−iP			17.7	1.2	7.0
12–13	Extreme microseismic activity					
18	+ePE	09	40	57.8	1.0	0.5
	−eP			57.8	1.0	1.0
20	−ePE	21	49	24.5	0.8	0.7
	+eP			24.4	1.0	2.0
21	+ePE	15	49	39.3	1.0	0.5
	+ePN			39.5	0.8	0.3
	+eP			39.3	1.0	3.0
25	eXE	05	09	04.1	3.4	4.0

March 1968

Date	Component and Phase	Arrival time h	Arrival time m	Arrival time s	Period s	Amplitude mm
02–06	Extreme microseismic activity					
09	+ePE	21	49	20.7	1.0	0.7
	+ePN			20.7	0.6	0.4
12–16	Extreme microseismic activity					
19–21	Extreme microseismic activity					
22	+ePE	02	07	30.3	0.8	0.6
	+eP			30.3	1.0	1.5
	−ePE	15	19	39.2	1.2	1.5
	−eP			39.2	1.2	6.0
24	−ePE	00	29	36.6	0.6	0.5
	−ePN			36.8	0.6	0.5
	−eP			37.0	0.8	1.0
	+ePE	20	24	51.5	1.0	0.8
	−ePN			51.4	0.8	0.8
	+eP			51.3	1.0	0.7
26	+iPE	00	53	07.7	1.0	1.6
	−iP			07.7	1.0	3.0
	+iPE	01	02	18.9	2.0	5.0
	+iP			19.3	1.6	3.0
28–31	Extreme microseismic activity					

April 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	+ePE	01	00	58.4	1.6	0.8
	−eP			58.4	1.0	1.5
	−ePE	21	11	19.8	1.2	1.0
	+ePN			20.1	1.0	2.0
	−eP			20.1	1.0	1.5
03–07	Extreme microseismic activity					
08	+iPE	14	31	22.2	1.0	3.5
	+iPN			22.2	0.6	3.0
	−iP			22.2	0.8	4.5
10–14	Extreme microseismic activity					
19	+ePE	08	15	49.1	0.8	0.5
	−ePE	09	11	54.5	1.2	1.3
	+ePN			54.5	0.8	0.8
	+eP			53.9	1.6	1.3
20	+ePE	01	07	41.5	0.8	0.7
	−ePE	20	24	30.8	1.0	0.5
	−eP			30.8	1.2	0.6
21	+ePE	03	41	04.7	1.0	0.4
	−ePN			05.2	1.2	0.8

May 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	−iPE	00	01	31.7	1.8	3.5
	+ePN			32.0		2.5
	−iP			31.6	1.8	6.5
02	−ePE	04	29	40.5	1.2	0.3
	−ePN			40.8	1.4	0.5
	+eP			40.5	1.4	1.0
	+iPE	23	38	23.2	2.0	3.5
	−eSE		48	29.7	1.8	1.4
	−ePN		38	23.2	1.0	1.0
	+eSN		48	29.2	1.8	0.5
	+iP		38	22.7	1.8	2.8
03	−ePE	29	00	11.2	1.2	0.5
	+ePN			11.1	1.2	0.2
	−eP			11.1	1.0	0.2
04	+ePE	06	14	11.7	1.4	0.1
	−ePN			11.8	0.8	0.2
	−eP			11.9	0.8	0.2
08–09	Extreme microseismic activity					
08	+ePE	11	08	26.9	1.6	0.8
	−ePN			26.8	1.6	1.0
	+eP			26.6	1.0	1.0
09	+ePE	07	31	39.5	1.8	2.8
	+ePN			39.2	1.2	0.6
	+iP			39.2	1.8	4.0
10	+ePE	23	00	55.9	1.4	0.1
	+ePN			55.7	1.0	0.4
	+iP			55.6	0.8	1.0
11	−iPE	13	40	06.5	0.8	1.8
	+eXE		42	04.4	1.6	1.2
	+ePN		40	06.9	0.7	0.6
	−iP		40	06.7	0.8	4.6
	iX		42	03.9	1.6	1.5
	−ePE	15	46	34.7	1.6	1.5
	+ePN			34.9	1.2	0.5
	+iP			34.9	1.2	2.5
13	eXE	16	54	11.0	0.7	1.0
	eXN			10.7	1.0	2.0
	eX			11.6	1.0	1.5
14	+ePE	14	23	32.6		0.4
	+ePN			32.6		2.0
	+eP			32.6	1.8	3.1
15	+ePE	08	00	40.0	1.8	3.0
	+ePN			38.7	1.4	2.1
	−eP			39.5	1.2	3.5

May 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
15	+ePN	15	12	27.6	1.0	1.0
	+eP			27.5	1.1	2.0
16	+ePE	01	08	20.8		2.1
	+ePN			21.5	1.6	0.5
	−eP			21.3		5.0
	−eS		24	44.2	4.0	6.5
	LP +eP		08	21.4	3.8	5.5
	+iS		24	46.8	9.4	12.0
	−ePE	22	56	52.1	1.6	1.0
	−ePN			52.3	1.2	1.0
	−iP			52.3	0.6	3.0
	eXE	23	26	24.3	2.8	3.0
	eXN			24.3	2.0	1.0
	eX			23.9	3.0	4.5
17	+ePN	08	09	33.4	1.2	2.4
	+ePN	19	11	50.2	0.4	2.0
	−eP			50.2	0.4	3.0
18	+ePE	00	12	12.0	1.6	1.2
	+ePN			11.8	1.8	0.3
	+eP			11.5		1.0
	−ePE	01	08	56.8	1.6	2.5
	iXE		14	08.2	2.4	7.6
	+ePN		08	57.0		0.2
	eXN		14	08.6	2.4	3.0
	−iP		08	57.1	1.6	4.5
	eX		14	08.2	2.0	2.8
	−ePN	08	27	12.2	0.8	0.4
	−eP			12.2	0.6	0.8
	+ePE	16	04	17.2		1.5
	+ePN			16.2	1.0	0.7
	−eP			16.2	1.0	0.8
	+ePE	20	38	05.8	0.7	1.2
	+ePN			06.2	0.6	0.5
	+eP			06.2	0.6	0.4
20	−iPE	07	24	54.6	1.2	3.8
	+eSE		34	32.4	1.6	0.5
	+iPN		24	54.5	1.6	9.0
	+eSN		34	32.5	1.8	1.5
	+iP		24	54.5	1.6	23.0
	+eS		34	32.8	3.6	2.0
	−ePE	10	23	12.8	0.8	0.5
	LP +iPE	20	17	45.8	3.8	3.0
	+iSE		27	26.1	3.8	4.0
	+iPN		17	45.8		1.5
	+iSN		27	28.9	3.8	6.0

May 1968

Date	Component and Phase	Arrival time h	Arrival time m	Arrival time s	Period s	Amplitude mm
23	LP +iPE	17	34	58.4		3.0
	−iSE		43	36.0	5.6	10.0
	+iPN		34	58.4		7.0
	+iSN		43	35.1		4.0
24	Extreme microseismic activity					
25	−ePE	23	59	48.0	0.8	0.5
	−ePN			47.1	1.0	1.1
	−eP			47.2	1.0	2.5
26	−ePE	14	50	01.5	1.8	1.0
	+ePN			01.3	1.6	1.1
	eXN		52	41.8	4.0	3.5
	−eP		50	01.3	1.2	0.6
	eX		52	41.0		2.0
28–29	Extreme microseismic activity					
30	+ePE	04	35	29.2	1.8	1.8
	−ePN			29.3	1.8	2.0
	−eP			29.2	1.8	5.6
	+ePE	19	54	14.7	1.6	1.6
	+eSE	20	03	58.8	3.0	1.9
	−iPN	19	54	14.6	2.0	4.5
	−eSN	20	03	59.8	2.4	1.5
	−iP	19	54	14.4	2.2	11.4

June 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	+ePE	11	34	23.1	1.2	0.2
	+ePN			23.2	1.0	0.2
	+eP			23.2	1.0	1.0
02	−ePE	08	31	42.8	1.0	0.6
	+ePN			42.8	0.8	0.5
	−eP			42.5	0.8	1.3
03	+ePE	09	30	29.7	1.8	1.2
	−ePN			29.8	2.0	1.1
	+eP			29.6	0.8	1.2
04	+ePE	10	51	20.0	1.4	1.0
05	+iPE	12	53	49.2	1.4	2.7
	−iPN			49.3	1.8	4.0
	−iP			49.3	1.6	6.5
06	−ePE	12	57	28.5	0.8	0.3
	−ePN			28.4	0.8	0.2
	−eP			28.1	0.8	0.7
	+ePE	20	45	14.0	1.0	0.8
	+ePN			13.9	0.8	0.5
	+iP			14.0	0.8	1.0
07	+ePE	12	10	04.9	2.4	1.2
	+eSE		20	31.1	10.0	4.0
	−ePN		10	04.9	2.4	1.0
	−eP			04.9	2.8	2.3
	LP −ePE	12	10	07.6	3.8	3.5
	−iSE		20	24.2	9.4	11.0
	−eSN			24.2	9.4	4.5
	+iP		10	05.7	5.6	6.0
	−ePE	21	43	25.8	1.4	1.0
	+eP			25.8	1.4	1.5
08	+iPE	23	28	43.0	1.6	3.4
	+eSE		32	14.6	1.2	5.2
	−iPN		28	43.5	1.6	7.8
	+iP			43.5	2.0	10.2
	LP −iPE		28	43.9		1.5
	−iSE		32	17.6		10.0
	−iPN		28	42.1		10.0
	−iSN		32	17.6		4.5
	−iP		28	42.1		15.5
12	−ePE	14	00	58.7	2.0	0.6
	+ePN			58.7	1.6	0.3
	+eP			58.8	2.4	1.5
	LP −ePE		01	07.3		0.5
	−iSE		04	34.2	3.8	10.0
	−iSN			34.2	3.8	4.5
	+eP		01	07.3		1.0

June 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
12	+ePE	14	16	50.7	0.8	1.5
	+ePN			50.8	0.8	0.2
	+iP			50.7	1.0	2.4
	+ePE	20	28	49.3	1.4	1.0
	+ePN			49.9	1.4	0.6
	−eP			49.3	1.2	1.2
13	+ePE	21	51	19.7	1.2	0.2
	+ePN			19.8	1.4	0.5
	−eP			19.8	1.0	0.8
15	+ePE	11	47	11.9	1.4	0.8
	−ePN			11.8	2.0	1.0
	+iP			11.6	0.8	1.2
	+ePE	13	46	53.9	1.6	0.4
	+ePN			54.4	1.4	0.2
	+eP			53.4	1.4	0.3
	+ePE	14	19	38.9	1.2	0.6
	+ePN			38.9	1.0	0.4
	+iP			38.9	1.0	3.2
16	+iPE	19	18	44.8	1.2	1.5
	−iPN			44.8	1.0	1.3
	+iP			44.8	1.2	2.0
	LP +iPE		18	44.8		5.0
	−iSE		22	28.9	3.8	7.5
	−iPN		18	45.8		3.0
	−iSN		22	32.6		4.5
	−iP		18	43.9		1.5
	−iS		22	29.8		5.5
17	+ePE	10	53	47.7	0.6	0.5
	+eP			47.7	0.8	1·1
	−iPE	18	22	34.7	1.6	1.6
	+iPN			34.7	1.6	1.2
	+iP			34.7	1.4	3.1
19	+iPE	08	26	52.1	1.4	1.3
	+ePN			52.2	1.2	0.2
	+iP			51.9	1.2	3.2
	LP +iPE		26	53.0	3.8	1.5
	+iSE		37	28.5		7.0
	−iP		26	53.0		3.0
	−PP		30	43.6	3.8	3·5
	+ePE	11	37	42.7	1.4	0.7
	+ePN			43.0	1.4	0.5
	+eP			43.2	1.0	0.8
	−ePE	20	07	51.0	1.2	1.0
	−ePN			51.0	1.6	0.2
	−eP			51.0	1.5	1.2

June 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
20	+ePE	02	51	55.8	1.8	0.6
	+eP			55.8	2.0	1.0
22	+ePE	00	34	19.6	1.0	1.0
	+ePN			20.4	0.6	0.4
	+eP			19.4	1.0	1.3
23	+ePE	11	25	16.0	1.4	0.8
	+ePN			15.8	0.8	0.6
	+eP			15.7	0.8	0.6
26	+eP	02	02	13.8	1.2	0.9
	−ePE	15	52	44.3	1.4	0.3
	+ePN			44.2	2.4	0.3
	+eP			44.4	1.0	0.3
27	−iPE	22	25	56.6	1.0	3.0
	+ePN			56.6	1.0	0.4
	+iP			56.6	1.0	6.0
28	−ePE	12	41	40.3	1.0	1.0
	−ePN			40.2	1.0	1.0
	−eP			40.1	1.4	4.0

July 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	+ePE	11	04	08.0	1.4	0.5
	−ePN			07.8	1.6	0.4
	+iP			07.6	1.2	1.0
02	+iPE	04	42	44.6	1.8	3.0
	+iPN			44.5	1.4	4.0
	+iP			44.4	1.3	6.0
	−ePE	18	53	08.3	1.0	0.5
	−ePN			08.6	1.2	0.6
	+eP			08.0	1.2	1.0
	−ePE	19	59	21.2	1.0	0.4
	+ePN			21.1	0.8	0.2
	+eP			21.1	1.2	0.8
03	+ePE	01	22	23.2	1.2	0.2
	−ePN			23.2	1.2	0.4
	−eP			23.0	1.2	1.1
04	−ePE	23	14	00.5	1.6	0.6
	+ePN			00.4	1.6	0.8
	−eP			00.7	1.4	1.0
05	+ePE	11	47	18.1	1.4	0.5
	+ePN			18.7	1.4	0.1
	−eP			18.3	1.2	1.5
	+ePE	13	49	44.5	1.0	1.2
	+ePN			44.2	0.8	0.8
	+iP			44.2	0.8	1.8
06	−eP	14	22	27.5	1.4	0.5
	+iPE	19	41	31.7	0.8	1.5
	−ePN			31.7	1.0	0.6
	−iP			31.7	1.0	3.0
07	−ePE	03	35	40.1	1.0	0.5
	+ePN			40.2	0.4	0.3
	+eP			40.2	0.8	0.6
	−ePE	12	55	25.0	1.0	1.0
	+eP			25.3	0.8	1.0
08	−eP	00	01	24.7	1.6	0.8
10	+ePE	11	24	06.4	1.0	0.4
	−eP			06.4	1.4	1.0
	LP +ePE		24	06.2		1.0
	−PPE		25	39.0	3.8	2.5
	−PPPE		25	56.7	2.0	1.0
	−iSE		30	05.3	9.4	6.0
	+ePN		24	06.2		0.5
	−iSN		30	06.2	7.6	4.0
	−eP		24	06.2		1.0
	−PP		25	37.1	3.8	4.0
	−PPP		25	56.7	7.6	5.5

July 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
15	+ePE	10	18	55.9	1.4	0.4
	−ePN			56.0	1.2	1.2
	−iP			55.9	0.6	2.0
17	+ePE	05	36	25.4	2.0	0.6
	−eP			25.4	1.8	1.0
19	+ePE	05	09	07.2	1.4	0.5
	−ePN			07.2	1.0	0.3
	−eP			06.8	1.4	1.0
	−ePE	09	34	02.5	1.4	0.8
	+ePN			02.7	1.2	0.2
	+eP			02.5	1.6	1.4
20	Extreme microseismic activity					
21	+ePE	17	36	19.9	1.4	1.0
	+ePN			19.6	1.4	0.4
	−eP			19.9	1.4	1.0
22	−ePE	05	14	12.7	1.4	1.0
	+ePN			12.7	1.4	1.0
	−iP			12.7	1.4	1.2
	LP +iPE		14	13.6	2.0	4.3
	−iSE		18	18.8	5.6	8.5
	−iPN		14	13.6		2.3
	−iSN		18	18.4	9.4	9.5
	−iP		14	13.6	2.0	5.5
	−eS		18	26.8	5.6	10.5
	−ePE	18	10	58.7	1.4	0.8
	+ePN			58.7	1.4	0.5
	+iP			58.7	1.	1.3
23	−ePE	03	31	59.9	1.6	1.5
	−ePN		32	00.9	1.4	1.4
	+eP			01.4	1.4	1.0
24	+ePE	01	05	33.8	0.6	0.3
	−ePN			33.9	1.4	0.3
	+eP			34.0	0.8	0.3
	−ePE	17	35	11.9	0.8	0.2
	−ePN			11.6	0.8	0.4
	+eP			11.7	0.6	0.5
25	−iPE	07	34	53.2	2.0	3.0
	−eSE		44	33.1	2.4	3.8
	+iPN		34	53.1	2.0	5.2
	+eSN		44	32.3	2.8	5.5
	+iP		34	53.1	2.0	10.4
	+eS		44	32.7		2.4
	LP −iPE		34	52.6	3.6	10.5
	−iSE		44	33.5	5.6	14.0
	+iPN		34	52.6	3.6	23.5
	iSN		44	33.5	5.6	15.5
	−iP		34	52.6	3.6	6.8

July 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
25	−ePE	07	59	33.8	1.0	0.3
	+eP			33.8	0.8	1.2
	+ePE	11	09	55.7	0.6	0.2
	−eP			55.3	1.8	1.0
	+ePE	19	04	08.3	1.4	0.2
	−ePN			08.3	1.0	0.2
	−eP			08.3	1.0	1.0
	+ePE	20	37	38.3	2.2	1.5
	+ePN			38.3	2.0	0.3
	−eP			38.1	2.2	1.5
26	+ePE	17	17	02.5	1.6	0.2
	+ePN			02.8	1.4	0.5
	+eP			02.5	1.2	0.6
27–28	Extreme microseismic activity					
28	−ePN	11	11	02.0	1.6	0.6
	+eP			01.6	1.2	0.8
	+eP	21	30	37.9	1.0	2.0
29	−ePN	11	24	34.6	3.0	0.8
	−eP			34.6	3.0	1.5
	LP +iSE		35	03.2	5.6	3.0
	+ePN		24	35.0		0.5
	+eSN		35	03.2	7.6	1.5
	+iP		24	35.0	3.8	3.5
	+ePE	12	32	22.5	1.6	0.5
	+ePN			22.1	1.4	0.5
	+eP			22.1	1.2	0.3
30	−ePE	00	05	21.3	2.0	1.0
	+ePN			21.1	2.0	0.3
	+eP			21.3	1.6	1.6
	LP −ePE		05	21.9	2.0	4.5
	+eSE		15	51.0	5.6	1.5
	ePN		05	21.9		0.3
	−iP		05	21.9	2.0	4.5
	−ePN	04	22	48.5	1.4	0.8
	−eP			48.6	1.2	1.0
	+ePE	20	51	56.5	1.0	0.3
	−ePN			56.8	1.1	0.3
	+eP			56.1	1.4	1.0
	−ePE	22	25	18.7	1.4	0.6
	+ePN			18.7	1.2	0.5
	−eP			18.7	1.4	0.5
31	−ePE	13	57	43.9	1.4	0.4
	+ePN			44.0	1.0	0.4
	+eP			43.9	1.2	1.0

August 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	−ePE	00	26	16.6	1.2	1.0
	+iPN			16.6	1.0	1.8
	+iP			16.6	2.2	4.0
	LP −iPE		26	15.0		0.7
	+iSE		36	11.3	7.6	2.5
	+iPN		26	15.0	2.0	2.3
	+iSN		36	11.3	5.6	3.0
	−iP		26	15.0	2.0	5.5
02	LP −ePE	01	33	17.1		1.0
	+PPPE		37	49.0		1.5
	−iSE		43	56.5	6.0	7.0
	+iXN		37	50.5	3.8	1.3
	+eSN		43	57.4	6.0	3.0
	−iP		33	17.1	5.6	3.0
	−PP		36	16.2	9.4	4.5
	+iX		37	49.9	7.6	29.0
	+eP	14	25	32.4	1.2	0.6
	LP iXE		36	55.4	16.8	9.5
	eXE		43	45.2	11.2	5.0
	iXN		36	55.4	7.6	2.0
	iXN		43	47.0	11.2	6.5
	+eP		25	37.6	3.8	1.0
03	−ePE	05	13	09.8	2.0	0.4
	−ePN			10.0	2.0	0.4
	+eP			09.9	1.8	1.2
	LP −eP		13	07.7		0.5
04	−iPE	11	54	37.0	1.2	1.2
	−ePN			37.5	1.2	0.6
	+iP			36.8	1.4	2.0
05	+iPE	00	02	22.7	1.0	2.0
	+eSE		06	05.6	0.6	1.2
	−iPN		02	22.8	1.2	2.2
	+eSN		06	04.8	0.6	1.0
	+iP		02	22.8	1.0	3.0
	−eS		06	05.6	0.6	1.2
	−ePE	16	35	55.0	2.0	1.2
	+ePN			55.0	2.0	0.2
	+eP			55.0	2.0	2.5
08	−ePN	20	42	55.2	1.6	0.5
	+eP			54.9	1.6	0.4
09	−ePN	03	20	48.5	1.6	0.2
	+eP			47.5	1.6	0.6
	+ePE	07	01	44.5	1.0	0.3
	+ePN			44.5	1.0	0.1
	+eP			44.4	1.0	0.4

August 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
09	+ePE	07	24	15.8	1.0	0.5
	+ePN			15.8	1.0	0.2
	+eP			15.8	1.0	1.3
10	−ePE	02	20	03.2	1.2	1.2
	+eSE		30	34.8	2.4	2.4
	+ePN		20	03.1	1.2	0.5
	+eSN		30	34.4	2.6	2.1
	+iP		20	03.2	1.2	2.1
	LP −iPE		20	09.1	7.6	13.0
	−PPE		23	31.6	5.6	13.0
	−eSE		30	40.0	5.6	13.0
	+iPN		20	09.1	7.6	2.0
	−eSN		30	40.0	5.6	2.5
	−iP		20	09.1		46.5
	−PP		23	31.6	5.6	26.0
	+ePE	04	18	49.2	1.2	0.3
	+ePN			49.7	1.0	0.2
	−eP			48.8	1.4	0.6
	+ePE	06	04	46.0	0.4	0.4
	+ePN			45.8	0.6	0.2
	−eP			45.9	0.6	1.0
	−ePE	10	18	53.2	0.8	0.3
	+eP			53.3	0.6	0.4
	+ePE	19	30	54.0	1.0	0.4
	−ePN			53.8	1.2	1.0
	−eP			53.9	1.0	1.2
11	−ePE	02	54	14.4	1.2	1.0
	−ePN			14.4	1.0	0.2
	−iP			14.4	1.0	2.0
	−ePE	20	13	42.4	1.4	0.4
	+ePN			42.4	1.6	0.1
	+eP			42.4	1.6	1.0
13	Extreme microseismic activity					
14	−ePE	22	27	02.1	1.4	0.6
	−ePN			02.4	1.2	0.2
	+eP			02.6	1.6	0.4
15	−ePE	07	02	47.9	0.6	0.3
	+ePN			47.8	1.2	1.0
	+eP			47.9	0.6	1.4
	LP −iPE	08	27	10.0	3.8	5.0
	−PPE		30	47.5	13.2	6.0
	−iPN		27	10.9	5.6	1.5
	+PPSN		38	28.8	13.2	20.0
	−iP		27	10.0	3.8	19.0
	−PP		30	47.5	13.2	18.5
	−PPP		32	36.3	13.2	12.5

August 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
15	+ePE	11	53	11.1	1.0	1.0
	−ePN			11.1	1.4	0.4
	−eP			11.1	1.0	2.2
	+ePE	17	54	32.1	1.8	0.3
	−ePN			32.1	1.6	0.4
	−eP			32.1	1.8	1.0
	+ePE	19	46	55.1	1.4	0.3
	−ePN			55.1	1.2	0.2
	+eP			55.1	1.4	0.5
16	Extreme microseismic activity					
17	−ePE	04	13	34.8	1.0	1.0
	−ePN			34.8	2.0	0.5
	+eP			34.6	1.6	0.8
18	+ePE	12	14	29.7	0.8	0.2
	−eP			29.7	1.0	1.0
	+ePE	18	21	34.5	1.0	0.2
	+ePN			33.7	1.2	0.3
	+eP			33.7	1.2	0.6
16	+iPE	18	50	32.9	1.2	3.0
	eXE		52	37.4	1.8	5.0
	−eSE	19	00	16.7	2.8	3.3
	−iPN	18	50	32.9	1.2	2.8
	eXN		52	38.7	1.8	3.5
	+eSN	19	00	17.0	3.0	5.8
	−iP	18	50	32.9	1.2	9.0
	eX		52	37.7	0.8	5.0
	+eS	19	00	17.0	1.8	1.4
	LP +iPE	18	50	37.1	2.0	3.0
	iXE		52	37.6		1.0
	−iSE	19	00	15.3	3.8	6.5
	−iPN	18	50	37.1	2.0	2.0
	iXN		52	37.6		2.0
	+iSN	19	00	15.3	3.8	13.5
	+iP	18	50	37.1	2.0	11.0
	eX		52	37.6	3.8	13.5
	−iS	19	00	15.3	5.0	9.0
	+ePE	19	09	46.2	1.2	1.0
	+ePN			46.7	1.0	1.0
	+eP			46.3	1.6	2.0
	+ePE	19	18	27.7	1.0	1.0
	+ePN			27.2	1.0	0.5
	+eP			27.4	0.8	1.8
19	+ePE	15	55	21.9	0.6	0.3
	−ePN			22.1	0.6	0.6
	+eP			22.1	0.8	1.0

August 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
20	+ePE	02	56	53.5	0.8	0.6
	−ePN			53.5	0.8	1.0
	−eP			53.5	0.4	1.6
	−ePE	15	37	18.3	1.0	0.6
	+ePN			18.2	1.0	1.2
	+eP			18.4	0.8	3.0
21	−ePE	18	08	35.3	0.6	0.4
	+ePN			35.8	0.6	0.4
	−eP			35.9	1.6	0.4
	LP +ePE		08	42.2		0.5
	−ePN			42.2		0.5
	−eP			41.3	2.8	0.5
22	Extreme microseismic activity					
23	−iPE	22	47	34.9	1.0	5.2
	eXE		49	26.7	1.6	6.0
	−eSE		56	24.9	1.2	3.5
	+ePN		47	35.7	0.8	1.5
	eXN		49	27.3	0.8	1.0
	+eSN		56	24.9	2.8	4.5
	−iP		47	34.9	1.4	12.3
	eX		49	25.9	1.2	8.0
	+eS		56	26.4	1.0	1.8
	−ePE	23	25	35.9	0.6	2.0
	+ePN			35.9	0.8	0.4
	−eP			36.0	0.8	6.0
24	−ePE	12	30	58.2	1.0	0.2
	−ePN			57.9	1.2	0.2
	+eP			58.5	0.6	0.5
	+ePE	15	18	34.5	1.2	0.6
	−ePN			34.4	1.2	0.6
	−eP			34.3	2.0	1.6
25	+ePE	11	28	25.7	1.2	0.4
	−ePN			25.7	1.2	1.0
	−eP			25.7	1.2	1.5
	−ePE	13	36	06.5	1.4	0.2
	−ePN			06.5	1.4	0.4
	+eP			06.5	1.2	1.0
28	+ePE	12	03	07.4	1.0	0.2
	−ePN			07.4	1.2	0.6
	−eP			07.4	1.0	1.0
29	−ePE	23	34	39.9	1.2	3.8
	−ePN			39.7	1.2	3.6
	+eP			39.3	1.0	4.0
31	LP +ePN	11	06	19.2	6.0	2.5
	−iSN		12	32.4	7.6	6.0
	+eP		06	19.2	3.8	2.0

September 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
01	+ePE	00	35	57.0	1.2	1.3
	−ePN			57.3	1.2	3.0
	−eP			57.4	1.0	5.2
02	Extreme microseismic activity					
03	+ePE	23	42	54.6	1.4	0.3
	−ePN			54.8	1.6	0.3
	−eP			54.8	1.6	1.0
05	+ePE	02	52	55.7	1.4	1.0
	+ePN			55.7	2.0	0.6
	+eP			55.7	1.4	1.5
	+ePE	20	06	56.6	0.6	0.4
	+ePN			56.4	0.6	0.3
	+eP			56.4	0.8	0.2
06	+ePE	07	48	45.2	1.8	0.5
	+ePN			44.9	1.6	0.2
	+eP			44.8	1.8	0.4
	+ePE	14	19	38.4	0.4	0.2
	+ePN			38.5	0.4	0.2
	+eP			38.4	1.0	2.0
07	−ePE	02	13	29.6	1.2	0.2
	−ePN			29.4	0.6	0.2
	−eP			29.4	0.6	0.5
	+ePE	07	00	58.4	0.6	0.2
	+ePN			59.0	1.0	1.0
	−eP			59.0	1.0	1.0
	−iPE	15	58	11.0	1.4	1.5
	−ePN			12.2	1.0	0.6
	−iP			11.0	1.2	1.5
	−eP	23	28	19.3	1.4	1.0
08	−ePE	13	10	32.0	1.0	1.2
	−ePN			32.1	0.8	0.3
	−iP			32.0	1.0	1.5
	+ePE	13	42	35.8	1.4	0.3
	+ePN			35.3	1.6	0.2
	+eP			35.3	1.2	0.3
	+ePE	15	25	28.3	1.6	3.0
	−ePN			28.3	1.6	1.5
	−eP			28.3	1.8	7.0
	LP −ePE		25	28.8		1.0
	−PPE		29	03.5	3.8	3.0
	+eSE		36	23.3	7.6	1.5
	−ePN		25	28.8		1.0
	−PPN		29	06.3	7.6	1.0
	−eSN		36	23.3	7.6	1.5
	−eP		25	28.8		0.5
	+PP		29	03.5		1.0

September 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
09	+ePE	00	50	31.1	1.0	0.3
	+eP			31.1	1.2	1.0
11	−ePE	18	36	29.6	1.0	0.2
	+ePN			29.8	1.0	0.2
	−eP			29.0	1.2	1.2
12	+ePN	08	29	44.2	1.0	0.7
	+eP			44.2	1.0	0.6
	+iPE	22	55	38.3	1.0	3.5
	eXE		57	50.8	1.4	2.0
	−eSE	23	05	00.5	2.0	7.8
	−iPN	22	55	38.3	1.0	7.0
	eXN		57	51.5	2.2	4.0
	+eSN	23	05	01.0	2.0	7.0
	−iP	22	55	38.3	1.0	24.0
	eX		57	51.3	1.6	7.0
	+eS	23	05	00.5	1.8	2.0
13	+ePE	06	59	36.0	1.2	1.0
	−ePN			35.7	1.4	1.6
	−eP			35.7	1.0	3.2
14	−ePE	01	34	15.2	1.4	1.5
	−ePN			15.4	1.2	0.3
	+eP			14.9	1.8	3.0
	+ePE	07	08	16.6	1.2	0.5
	+ePN			17.0	1.4	0.5
	−eP			16.8	1.0	1.2
16	+ePE	02	08	53.2	1.6	0.2
	−ePN			54.2	1.4	0.2
	−eP			53.2	1.6	0.5
	−ePE	14	08	35.2	1.0	1.8
	+eSE		19	00.2	3.6	3.0
	+ePN		08	35.4	1.0	1.0
	+eSN		19	00.2	3.0	2.4
	+eP		08	35.3	1.0	3.0
	LP −iPE		08	35.2	5.6	2.0
	+iSE		19	01.5	5.6	4.5
	+iPN		08	35.2	5.6	0.5
	−iSN		19	01.5	3.8	3.5
	−iP		08	35.2	5.6	1.0
	+ePE	14	23	24.7	1.6	1.5
	−ePN			24.5	1.6	2.0
	−eP			24.7	1.2	7.0
	−ePE	16	13	50.2	1.0	0.5
	+ePN			50.0	1.6	0.6
	+iP			50.2	1.2	2.0

September 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
17	+ePE	14	19	38.7	1.6	0.6
	+ePN			38.9	1.6	0.6
	−eP			38.5	1.6	3.8
	−ePE	20	54	31.9	1.4	0.6
	+eP			31.1	1.6	0.6
18	+ePE	11	56	19.0	1.4	0.7
	−ePN			19.0	1.6	0.8
	−iP			19.0	1.2	2.2
	+ePE	14	23	54.0	1.6	1.3
	+ePN			53.5	1.6	0.8
	+eP			53.7	1.4	1.0
19	+ePE	22	00	27.9	0.4	0.6
	+ePN			28.9	1.0	0.6
	−eP			26.9	1.2	1.2
	+ePN	23	45	48.9	1.4	0.5
	−eP			48.9	1.4	1.0
20	eX	06	18	11.9	1.8	5.0
20–22	Extreme microseismic activity					
20	LP −ePE	08	48	04.5	5.6	1.5
	−iSE		53	25.2	5.6	12.0
	−ePN		48	04.5		0.3
	+PcPN		50	43.0		0.5
	−iSN		53	25.2	3.8	2.0
	+eP		48	04.5	3.8	1.5
	+PcP		50	43.0	4.0	1.5
22	+ePE	08	12	21.6	1.4	2.0
	+ePN			21.0	1.6	1.2
	+eP			21.0	1.8	2.6
	−iPE	22	04	11.1	1.2	7.5
	−iSE		13	20.6	2.4	5.0
	−ePN		04	11.1	1.0	1.3
	+iSN		13	20.1	2.6	4.0
	−iP		04	11.1	1.2	16.5
	+iS		13	20.4	2.0	2.0
24	+ePE	08	59	05.1	2.0	0.6
	+ePN			05.6	1.2	0.6
	−eP			05.1	1.2	1.5
	−ePE	13	04	32.1	1.6	0.4
	+ePN			31.9	1.4	1.5
	−eP			31.9	1.0	1.0
	+ePE	17	24	39.1	0.8	0.3
	−ePN			39.7	1.2	1.0
	−eP			39.6	1.0	4.0

September 1968

Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
25	−ePE	07	12	43.2	2.0	1.3
	+ePN			43.4	2.0	2.2
	+eP			43.2	2.2	4.5
	LP −ePE		12	43.0		0.5
	−ePN			43.0	3.8	1.0
	−eP			43.0	3.8	1.0
26	+iPE	14	50	01.5	1.2	1.0
	+eSE	15	00	01.2	2.0	0.6
	−iPN	14	50	01.5	1.0	2.5
	+eSN	15	00	02.0	2.0	1.5
	−iP	14	50	01.5	1.2	7.0
	−eS	15	00	02.2	1.8	1.0
	−ePE	18	14	39.6	1.8	1.2
	+eSE		24	24.3	3.0	9.0
	+iPN		14	39.7	1.6	2.0
	+eSN		24	22.1	3.0	3.0
	+iP		14	39.8	1.6	4.0
	+eS		24	24.1	2.0	1.0
	LP −iPE		14	39.9	3.0	2.0
	+iSE		24	23.8	5.6	10.5
	+iPN		14	39.9	3.0	4.5
	+iSN		24	21.6	3.0	3.7
	−iP		14	39.9	3.8	14.5
	−iS		24	26.6	15.0	8.5
27	−iPE	04	11	09.6	0.8	1.6
	+eSE		21	12.2	1.4	2.0
	+ePN		11	09.6	0.8	1.0
	+eSN		21	12.2	1.2	0.7
	+iP		11	09.6	0.8	5.0
	LP +ePE		11	09.7	2.0	0.5
	−eSE		21	12.4	5.6	3.6
	−ePN		11	10.6	2.0	0.5
	+iSN		21	13.4	3.0	1.7
	−iP		11	09.7	2.0	0.8
	−iS		21	13.4	5.6	3.5
	+ePE	16	52	54.7	1.6	0.5
	+eSE	17	02	43.0	3.4	2.3
	+ePN	16	52	54.9	1.0	0.2
	+eSN	17	02	41.4	3.6	1.0
	+eP	16	52	54.7	1.6	1.5
	+eS	17	02	43.0	3.6	2.0
	+ePE	22	59	24.9	1.8	0.8
	+ePN			24.9	0.6	0.2
	+eP			24.7	0.6	1.2
28	−ePE	14	06	11.9	1.2	3.2
	−ePN			11.9	1.0	1.0
	−iP			11.9	1.6	12.0

September 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
29	+ePE	04	01	52.8	1.0	0.8
	+ePN			52.8	0.6	0.5
	+eP			52.6	0.6	1.0
	−ePE	13	39	45.8	1.0	0.4
	+eP			45.8	1.0	0.8
	−eP	13	49	33.6	0.8	1.0
	−ePE	19	53	55.6	1.0	1.0
	+ePN			55.5	1.0	0.4
	+eP			55.5	1.0	1.2
	−ePE	22	26	01.7	1.0	0.5
	+ePN			01.7	1.0	0.3
	−eP			01.7	0.8	1.4
30	+ePE	11	49	15.7	1.6	0.5
	−ePN			15.6	2.0	1.0
	−eP			15.7	1.0	1.5
	−ePE	14	28	50.7	1.0	1.0
	+eP			50.7	0.8	1.3
	+ePE	18	55	03.3	1.4	0.8
	+ePN			02.7	1.2	0.5
	+eP			03.0	0.6	0.4

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	+ePE	01	05	29.9	1.6	0.6
	−ePN			29.9	1.6	1.3
	−eP			29.8	1.6	2.0
	−ePE	18	50	21.9	0.8	0.3
	−ePN			21.5	0.6	0.3
	+eP			21.8	0.8	0.4
	−ePE	20	32	42.5	1.0	0.2
	−eP			42.5	1.0	0.2
	−ePE	21	22	56.4	1.2	0.5
	+ePN			57.4	1.4	0.3
	+eP			57.4	1.6	0.6
02	+ePE	07	24	53.9	0.8	0.5
	+eP			53.9	1.2	1.0
	+ePE	14	09	43.8	1.0	0.6
	+ePN			44.4	1.2	0.3
	+eP			44.0	1.0	1.0
03	+ePE	08	17	25.2	1.0	1.4
	−ePN			25.2	1.0	1.0
	−iP			25.2	1.2	3.5
	+ePE	12	29	37.2	1.6	1.2
	+ePN			36.2	2.0	0.8
	+eP			36.2	1.6	1.5
04	−iPE	06	10	48.7	1.0	3.0
	eXE		15	49.3	3.6	9.0
	+eSE		21	08.1	1.8	3.8
	+ePN		11	49.7	1.8	4.0
	eXN		15	48.6	1.8	4.8
	−eSN		21	07.1	1.4	5.4
	−iP		10	48.6	1.0	6.0
04–05	Extreme microseismic activity					
05	−ePE	04	19	44.1	1.8	1.0
	+ePN			44.5	1.6	0.6
	+eP			44.7	1.2	1.5
06	−ePE	07	55	00.2	1.0	1.0
	+eP			00.2	0.6	1.2
	−ePE	09	00	13.2	1.4	1.0
	+ePN			13.2	1.8	1.0
	+eP			13.4	1.2	2.0
06–08	Extreme microseismic activity					
07	+ePE	19	38	10.4	1.0	2.6
	eXE		44	15.2	1.4	7.8
	+ePN		38	11.5	1.0	3.0
	eXN		44	15.2	1.8	5.0
	eX		44	15.2	4.0	5.0

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Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
07	LP −PPE	19	41	17.4		5.5
	−eSE		48	25.8	7.6	4.5
	−ePN		38	12.7		0.3
	+pPN		39	24.3		0.5
	+PPN		41	17.4		0.5
	−eP		38	12.7	2.0	5.0
	−pP		39	24.3	3.0	8.0
	−PP		41	17.4	3.8	10.0
	−eS		48	25.8	15.0	16.0
	+ePE	22	50	49.8	1.4	2.2
	−ePN			49.7	1.6	1.5
	+eP			50.1	1.2	4.5
08	+ePE	07	50	43.9	1.0	1.0
	−ePN			43.9	0.8	0.7
	−eP			43.9	1.0	3.0
	LP +iPE		50	43.6	3.8	2.8
	−PPE		52	11.7	5.0	1.5
	+iSE		56	39.1	9.4	4.0
	+iSN		56	41.0	11.2	3.0
	+iP		50	43.6	5.6	5.5
	−PP		52	11.7	5.0	3.5
	−eS		56	41.0	8.0	4.5
	−ePE	15	04	51.2	0.8	1.3
	−eSE		14	07.2	2.2	3.0
	+ePN		04	51.6	0.8	0.5
	+iSN		14	07.2	2.6	4.0
	−iP		04	51.2	1.0	4.0
	+eS		14	07.2	1.6	1.0
09–10	Extreme microseismic activity					
10	−ePE	15	18	50.3	1.4	3.0
	+ePN			50.3	1.8	2.0
	−eP			50.3	1.2	5.0
11	+ePE	08	02	14.2	0.4	0.7
	+ePN			14.2	0.8	0.4
	+eP			14.2	0.6	1.8
	+ePE	17	23	27.2	1.6	1.2
	−ePN			27.2	1.8	1.5
	−eP			27.2	1.8	5.0
12	−iPE	19	29	19.0	1.2	1.8
	eXE		31	27.0	1.6	1.2
	−eSE		38	44.7	2.2	4.8
	+iPN		29	19.0	1.2	3.2
	eXN		31	26.7	1.6	1.8
	+eSN		38	45.3	2.2	4.0
	+iP		29	19.0	1.0	10.0
	eX		31	26.7	1.8	2.3
	−eS		38	45.4	2.0	2.0

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Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
13	−ePE	08	16	55.4	1.2	0.7
	+ePN			55.5	1.0	1.0
	+iP			55.4	1.0	3.0
	−ePE	12	15	17.7	0.6	0.6
	−ePN			17.4	1.2	0.4
	−eP			17.7	0.4	1.0
14	+ePE	03	08	32.1	1.8	2.4
	+eSE		16	26.3	5.0	10.0
	−ePN		08	32.1	1.2	1.4
	+eSN		16	25.8	7.0	9.0
	−eP		08	31.8	1.2	5.0
	+eS		16	25.8	6.8	7.5
	LP +iPE		08	35.6	4.0	6.5
	+PPE		10	36.6	7.6	2.5
	+PcSE		13	41.2	5.6	2.5
	−eSE		16	34.4	6.0	7.0
	−iPN		08	35.6	4.0	1.5
	−eSN		16	34.4	6.0	7.5
	+iP		08	35.6	5.6	1.0
	+PP		10	36.6	7.6	1.0
	+eP	05	35	50.8	1.0	3.2
15	−ePN	17	42	05.4	1.2	1.3
	−eP			05.4	1.2	3.0
	+ePE	20	22	34.7	1.0	1.8
	−ePN			34.7	1.0	0.8
	−eP			34.7	1.0	2.0
16–17	Extreme microseismic activity					
17	−ePE	15	53	12.1	1.2	0.5
	−ePN			12.3	1.6	1.0
	+eP			11.9	1.2	1.6
18	+ePE	15	56	53.2	1.4	1.5
	−ePN			53.4	1.2	1.0
	+eP			53.1	1.6	3.0
19	−ePE	17	41	54.2	1.4	0.8
	+ePN			54.2	1.2	1.0
	+eP			54.2	1.4	2.2
20	+ePN	05	52	49.6	1.2	1.0
	+eP			49.5	1.6	1.8
	−ePE	13	43	55.1	1.4	0.5
	+ePN			55.1	1.4	0.5
	−eP			55.1	1.6	1.0
	+ePE	17	12	14.1	1.2	0.8
	+ePN			14.4	2.0	1.5
	+eP			14.1	1.2	1.3

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Date	Component and Phase	Arrival time h	m	s	Period s	Amplitude mm
23	+eP	02	02	06.7	1.6	1.5
	−ePE	13	37	38.5	1.0	1.0
	+eP			38.5	0.8	2.0
	+ePE	21	17	51.5	1.2	1.0
	eXE		21	30.0	3.0	3.8
	+eSE		28	46.5	3.6	3.2
	+ePN		17	51.5	1.6	1.4
	+eSN		28	46.5	3.0	6.5
	+eP		17	51.5	1.8	7.5
	eX		21	25.5	2.0	9.0
	LP −iPE		17	56.1	4.0	4.0
	+pPE		18	37.3	5.6	3.5
	+PPE		21	29.7	3.6	2.0
	−eSE		28	26.2	11.0	2.5
	+iPN		17	56.1	4.0	2.5
	+eSN		28	26.2	11.0	2.5
	−eP		17	56.1	4.0	18.0
	−pP		18	36.4	3.0	0.5
	+PP		21	29.7	5.6	6.0
	−eS		28	26.2		1.0
	+iPE	21	25	03.0	1.2	7.0
	+iPN			03.0	1.0	5.5
	+iP			03.0	1.4	13.0
24	LP +iPN	05	13	04.5	5.6	0.5
	+iP			04.5	5.6	0.5
	−eSE	08	17	31.7	13.2	3.0
	+eSN			34.5	11.2	2.0
	+ePE	17	45	28.3	0.8	2.2
	+ePN			28.3	1.0	3.0
24–27	Extreme microseismic activity					
27	−ePE	17	55	24.0	1.0	1.0
	+iP			24.1	1.2	3.5
28–29	Extreme microseismic activity					
28	−ePE	23	45	25.9	1.0	1.6
	+eSE		56	14.3	2.2	1.3
	+ePN		45	25.9	1.0	2.0
	+eSN		56	12.9	5.4	3.4
	LP −iPE		45	25.5	2.0	2.0
	−eSE		55	53.5	5.6	5.0
	−iPN		45	25.5	2.0	2.0
	+eSN		55	53.5	11.2	6.0
	−iP		45	25.5	2.0	2.5
29	+ePE	07	33	12.4	1.0	0.8
	−ePN			12.4	0.8	1.0

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
29	−iP	07	33	14.4	0.8	3.0
	−ePE	11	39	26.5	1.0	0.6
	−ePN			26.5	1.0	0.2
	−eP			26.2	0.8	1.0
	−ePE	17	13	40.3	1.4	0.8
	−ePN			40.9	1.4	0.5
	+eP			40.3	1.4	1.2
30	+ePE	09	53	21.8	1.0	0.6
	−ePN			21.8	1.0	0.5
	−eP			21.8	1.0	1.5
	+ePE	23	38	33.1	0.8	1.0
	+ePN			33.6	2.0	0.5
31	−ePE	09	19	34.1	1.2	3.0
	+eSE		28	04.9	2.6	1.0
	+ePN		19	34.1	1.0	0.6
	+eSN		28	04.6	3.0	0.6
	+iP		19	34.1	1.5	8.0
	+eS		28	04.9	2.2	3.0

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	+ePE	01	43	00.9	1.0	0.6
	−ePN			00.8	0.8	1.2
	−eP			01.0	1.0	2.5
03	−ePE	08	22	49.0	1.0	0.7
	+eP			49.0	1.2	1.3
	−ePE	08	59	10.9	1.0	0.6
	−ePN			10.9	0.6	0.2
	−ePN	09	25	14.2	0.8	0.5
	+eP			14.4	0.8	0.1
04	+ePE	09	14	50.9	1.0	0.3
	+ePN			50.9	1.0	0.6
	−iP			50.9	1.0	1.5
	+iPE	09	19	39.1	1.0	1.0
	−eSE		29	13.1	3.0	1.2
	−iPN		19	39.1	1.2	1.8
	+eSN		29	13.1	3.4	1.8
	−iP		19	39.1	1.4	6.0
	+eS		29	14.4	3.4	2.0
	−ePE	15	34	39.6	1.0	1.0
	−ePN			39.6	1.0	0.6
	−eP			39.6	1.0	3.2
	−ePE	19	26	04.1	0.8	0.3
	−ePN			03.7	0.8	0.4
	+iP			04.1	1.2	1.1
05–06	Extreme microseismic activity					
07	+ePE	03	45	56.0	1.6	0.5
	−ePN			56.0	1.6	0.8
	−eP			56.2	1.4	1.2
	+ePE	08	50	32.2	1.0	0.8
	−ePN			32.4	0.8	0.6
	−eP			32.5	0.8	0.3
	+iPE	10	21	36.1	1.0	2.2
	+iPN			36.2	1.0	3.1
	+iP			35.9	1.0	2.4
	−ePE	11	05	43.7	1.0	0.2
	−ePN			43.4	1.0	0.6
	+eP			43.7	0.8	0.6
08–09	Extreme microseismic activity					
08	−ePE	07	55	35.6	1.0	0.6
	+ePN			35.6	1.0	1.2
	+iP			35.6	1.2	3.6

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Date	Component and Phase	Arrival time h	Arrival time m	Arrival time s	Period s	Amplitude mm
08	−ePE	18	39	04.8	0.6	1.5
	+iPN			04.8	1.0	1.1
	+iP			04.8	1.0	2.8
09–16	Extreme microseismic activity					
16	+iPE	00	36	02.9	1.4	2.2
	−iPN			03.0	1.2	2.6
17	+ePE	05	31	37.6	1.2	1.8
	−ePN			37.6	0.8	0.8
	−eP			37.6	1.0	3.8
	+ePE	23	13	22.9	1.2	0.8
	−eP			22.7	1.0	1.5
18	+ePE	01	51	42.7	1.0	0.9
	−ePN			42.9	0.8	0.2
	−iP			42.6	0.8	2.2
	−ePE	02	55	04.4	1.0	0.6
	+ePN			04.4	1.2	0.8
	+eP			04.4	1.0	1.7
	+ePE	06	57	31.4	1.2	1.1
19	−ePN	07	47	56.3	0.8	0.3
	−eP			56.3	0.6	0.4
	−iPE	09	58	54.3	1.0	1.0
	+iPN			54.3	1.0	1.5
	−iP			54.3	1.0	2.1
	+ePE	10	26	19.3	1.2	0.6
	−ePN			19.3	1.0	0.8
	−eP			19.3	1.0	1.6
	−ePE	12	33	44.3	1.2	1.0
	+ePN			44.1	1.0	0.5
20	Extreme microseismic activity					
22–25	Extreme microseismic activity					
22	+ePE	08	47	32.4	1.0	1.0
	+ePN			32.4	0.8	0.5
	+eP			32.4	0.6	0.2
	−ePE	10	44	46.7	1.0	0.8
	+ePN			46.9	0.6	0.2
	+iP			46.7	1.2	3.2
24	eXE	21	43	32.4	2.0	1.8
	eXN			32.4	2.2	5.0
25	−ePE	11	31	24.3	1.4	0.6
	−eP			24.1	1.6	2.3

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
25	−ePE	18	50	08.6	1.0	1.2
	−ePN			08.6	1.0	0.8
	−eP			08.4	1.2	1.5
26	+iPE	00	08	18.3	1.2	1.5
	eXE		12	32.4	3.0	2.3
	−ePN		08	18.3	1.0	1.0
	eXN		12	30.9	3.4	8.5
	+iP		08	18.3	1.0	2.0
	eX		12	30.7	2.2	3.0
	−iPE	01	23	19.3	1.0	2.1
	+iPN			19.3	1.0	1.4
	+iP			19.3	1.0	7.2
27	−ePN	17	27	18.8	0.8	1.1
	−eP			18.9	0.8	1.0
	−ePE	17	52	41.3	1.0	0.3
	−ePN			41.3	1.0	1.0
	+ePE	18	51	29.8	1.0	0.5
	−ePN			29.8	1.0	0.5
28	+ePE	03	47	58.5	1.0	1.5
	+ePN			58.7	1.0	0.5
	+iPE	16	43	26.8	1.2	5.0
	−iPN			26.7	1.2	1.8
	−iP			26.2	1.8	10.1
	+ePE	22	15	11.2	1.0	0.8
	+ePN			10.7	1.0	0.8
	+eP			11.0	1.0	1.0
29	−ePE	04	14	16.1	1.0	1.3
	+ePN			16.3	1.0	0.8
	−iP			16.1	1.0	2.0
	−ePE	16	52	11.6	0.6	0.8
	−ePN			11.6	1.0	1.4
	+eP			11.4	0.8	1.5

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
01	−ePE	05	35	07.4	1.0	0.5
	+iPN			07.3	1.2	1.5
	eXN		36	44.7	2.4	1.5
	+iP		35	07.4	1.0	2.6
	eX		36	44.7	2.0	2.1
	−ePE	16	22	08.8	0.8	1.5
	−ePN			09.4	0.8	2.0
	+eP			09.4	0.8	2.0
02	−ePE	02	43	21.2	1.0	1.0
	+iPN			20.4	1.0	2.0
	−iP			20.5	1.0	4.8
	+ePN	12	12	31.9	0.6	0.3
	−eP			32.0	0.8	1.5
	+iPE	13	00	05.5	1.0	1.9
	−ePE	19	10	00.0	0.6	1.2
	+iP			00.4	1.0	3.0
03	+iPE	02	52	16.3	1.2	2.5
03–04	Extreme microseismic activity					
05	−ePE	00	21	28.8	0.6	1.5
	−ePN			28.8	0.6	0.8
	+eP			28.8	0.6	1.0
06	eXE	00	24	54.6	1.0	1.0
	eXN			54.6	2.0	3.0
	iX			54.5	1.2	3.2
07	−ePE	00	19	14.9	1.0	1.4
	−eP			14.9	0.8	1.5
	LP +ePE	05	11	03.4		0.3
	+eSE		21	47.9	6.0	1.0
	−eSN			47.9	6.6	1.0
	+eP		11	03.4	2.0	0.5
	+ePE	14	56	16.6	1.0	2.0
	−ePN			16.7	0.6	1.1
	+eP			16.6	0.6	0.6
	+ePE	17	22	43.2	1.4	0.6
	+ePN			43.2	1.4	1.3
	−eP			43.0	1.6	3.0
	−iPE	20	45	11.6	1.0	5.0
	−iPN			11.4	1.0	2.2
	−iP			11.5	1.0	12.0

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
07	−ePE	21	48	06.2	1.0	0.8
	eXE			23.2	2.0	7.3
	−eSE		58	19.8	3.6	2.0
	−ePN		48	06.2	1.2	1.5
	eXN			23.2	2.0	8.2
	−eSN		58	20.2	2.0	1.2
	+iP		48	05.2	1.0	2.2
	eX			23.8	1.0	5.8
	−ePE	22	36	36.9	1.0	0.5
08	+ePN	10	55	31.9	0.8	0.6
	+eP			31.9	0.8	1.0
	−iPE	13	23	57.3	1.0	0.5
	−ePN			57.5	1.0	0.8
	+iP			57.3	1.0	2.2
	−ePE	13	40	49.3	1.0	0.5
	+ePN			48.3	0.8	0.5
	−eP			48.8	1.0	1.0
09–10	Extreme microseismic activity					
09	−ePE	16	18	14.4	1.2	1.5
	+eP			14.4	1.2	1.8
10	−ePE	19	07	27.1	1.0	1.2
	+iPN			27.1	1.0	5.0
	−iP			27.1	1.0	4.5
	eX		10	22.3	1.0	3.0
	−ePE	20	48	51.7	1.0	1.3
	+ePN			51.4	1.2	1.0
	+eP			51.4	1.2	1.0
11	eXE	03	03	47.4	1.0	0.6
	eXN			47.0	1.4	2.1
	eX			47.2	1.2	4.0
	+ePE	03	52	17.7	0.8	1.2
	+ePN			18.4	8.6	0.8
	+iP			17.6	0.6	3.6
	+ePE	13	07	53.5	0.6	0.3
	−ePN			53.5	0.6	0.5
	+iP			53.4	0.8	1.9
	−ePE	21	46	27.5	1.2	0.4
	+ePN			27.6	1.2	1.2
	+iP			27.5	1.2	3.2
	+ePE	22	50	53.9	0.8	1.5
	+ePN			53.7	1.2	2.1
	+eP			53.6	1.2	1.0

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Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
12	+ePE	07	32	05.9	0.8	0.5
	+ePN			05.6	0.8	1.2
	+eP			05.6	0.8	3.0
15	+ePE	02	34	10.3	0.8	0.5
	+ePE	13	20	55.6	0.8	0.4
	−ePN			55.5	1.0	1.1
	−eP			55.5	0.8	0.2
	−ePE	13	37	51.2	1.0	1.1
	−ePN			51.2	1.0	1.5
	+eP			51.2	1.0	2.0
	−ePE	14	21	11.8	0.8	0.5
	+eP			11.7	0.8	2.1
	−ePE	14	59	54.2	1.0	1.0
	+eP			53.7	1.8	2.0
	−ePE	17	30	33.8	0.8	0.8
	+ePN			33.7	1.0	1.3
	−eP			33.8	0.8	0.8
16	+ePE	06	59	34.2	1.6	3.0
	−ePN			34.7	1.2	6.0
	+ePN	11	38	37.7	1.0	1.4
	−eP			37.5	1.0	2.2
17	+ePE	12	22	10.8	1.0	0.9
	+eSE		33	50.3	1.8	6.1
	−ePN		22	10.6	0.8	0.5
	−eSN		33	51.0	1.0	8.0
	+iP		22	10.7	1.4	6.0
	+eS		33	52.0	1.6	7.0
19	−ePE	15	35	40.8	1.0	1.6
	+ePN			40.6	1.6	2.2
	+iP			40.6	1.6	9.5
	+iPE	16	49	39.5	1.0	4.9
	+iPN			39.3	1.2	4.0
20	+ePE	22	35	48.1	1.2	1.5
21	−ePE	12	40	13.6	1.0	1.0
	−ePN			12.6	0.8	1.5
	+eP			13.0	1.0	1.2
22	−ePN	15	47	37.3	0.6	0.7
	−eP			37.4	0.6	0.5

Decmber 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
23	−ePN	05	00	20.1	0.8	0.8
	−eP			20.1	0.8	0.6
	−ePE	06	05	51.0	0.8	1.0
	−ePN			50.9	0.8	0.5
	−iP			50.8	1.0	3.6
	−ePN	10	59	02.8	0.8	0.5
	−eP			03.0	0.8	0.4
	−ePN	22	46	01.4	0.8	1.5
	+eP			01.4	1.0	2.1
24	+ePN	00	35	54.6	1.0	0.3
	+eP			54.7	1.0	0.5
	+ePE	18	56	58.3	1.4	1.4
	+ePN			58.0	1.0	0.3
	+iP			58.0	1.0	1.6
25	+ePE	04	13	04.0	1.4	1.0
	−ePE	08	37	10.0	1.2	0.5
	+ePN			09.9	1.2	0.7
	+eP			10.0	1.4	1.1
	+ePE	19	08	39.2	1.2	1.0
	+iPN			38.9	1.0	0.9
	+iP			38.9	1.0	2.0
	+ePE	22	53	03.9	1.0	1.5
	+iPN			03.9	0.8	1.0
	+iP			03.9	1.0	3.1
27	+ePE	02	16	46.5	0.8	0.2
	−ePN			47.0	0.8	0.4
	+eP			46.5	0.8	1.3
	−ePE	22	43	54.9	1.0	2.0
	+ePN			54.9	1.0	1.2
	+iP			54.9	0.8	5.6
28	+ePE	06	40	22.8	1.2	1.4
	+eP			22.4	1.0	1.9
	−ePE	17	50	35.8	0.8	0.4
	+ePN			35.8	1.0	1.2
	+eP			35.8	1.0	1.5
29	−ePE	02	07	16.0	1.0	1.0
	+iPN			16.0	1.0	2.5
	+iP			15.8	1.2	7.0
	+ePE	04	19	45.3	1.2	1.2
	+ePN			44.8	1.0	0.5
	+eP			44.6	1.0	1.6

Decmber 1969

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
29	−ePE	08	00	47.8	1.0	0.5
	+ePN			47.8	1.0	0.5
	−eP			47.6	1.0	1.2
	−ePE	03	11	02.1	1.0	1.5
	−ePE	16	40	42.0	0.6	0.5
	+ePN			42.8	1.0	1.2
	−eP			42.0	0.6	2.1
30–31	Extreme microseismic activity					

January 1969

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
02	+iPE	17	57	04.4	1.0	3.9
	+ePN			05.4	0.8	2.5
03–05	Extreme microseismic activity					
05	+ePE	12	39	47.0	1.6	0.8
	+eP			46.5	1.2	1.0
06	+ePE	15	42	10.9	1.4	1.5
	−eSE		52	08.9	2.2	1.0
	−ePN		42	10.9	1.6	4.0
	+eSN		52	08.9	2.4	1.0
	−eP		42	10.9	1.6	10.0
	+eS		52	06.9	2.6	2.0
08–17	Extreme microseismic activtiy					
18	+ePE	03	08	41.3	1.0	2.1
	eXE		13	35.4	2.0	5.2
	eXN			35.4	2.4	6.5
	eX			35.4	2.8	4.0
19	+ePE	07	21	02.3	1.4	2.0
	eXE		24	18.1	2.4	4.0
	+ePN		21	02.6	1.6	2.3
	eXN		24	07.5	1.8	1.0
	−eP		21	02.3	1.4	7.0
	eX		24	08.3	2.2	10.0
	−iPE	19	03	33.5	1.4	6.5
	+iPN		03	33.5	1.6	7.8
	+eSN		13	49.3	3.8	5.4
	+iP		03	33.5	1.4	31.5
	−eS		13	49.3	1.2	2.5
20	−ePE	14	40	04.4	1.4	1.0
	+ePN			04.4	1.0	0.3
	+iP			04.4	1.2	0.4
22	+eP	01	02	21.1	1.6	1.8
	−ePE	17	34	10.4	1.2	0.5
	−ePN			10.4	1.2	1.0
	+eP			10.4	1.0	1.0
23	Extreme microseismic activity					
24	+iPE	02	44	42.4	1.0	6.0
	+eSE		54	06.4	2.0	8.5
	+iPN		44	42.4	0.8	2.0
	+eSN		54	07.0	1.8	9.0
	+eP		44	42.4	1.0	8.0
	−eS		54	06.8	1.8	3.8
25	−ePE	05	32	13.4	1.6	1.0
	+eP			13.4	1.0	1.0

January 1968

Date	Component and Phase	Arrival time			Period	Amplitude
		h	m	s	s	mm
25	−ePE	11	17	34.4	1.6	0.8
	+ePN			34.4	1.4	1.0
	+eP			34.4	1.6	2.0
27–29	Extreme microseismic activity					
31	+ePE	00	27	26.2	1.2	1.5
	+eP			26.2	1.0	0.5
	−ePE	23	00	50.2	1.0	1.0
	−ePN			50.1	0.8	1.0
	−eP			50.1	1.0	1.3
	+ePE	23	42	15.5	1.0	1.0
	−iPN			15.5	1.0	2.0
	−iP			15.5	1.0	5.0